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BOOKS RECEIVED.

ASTRONOMY FOR STUDENTS AND GENERAL READERS.

By SIMON NEWCOMB, L. L. D., and EDWARD S. HOLDEN, M. A. Second Edition, Revised. Henry Holt and Company. New York, 1880. \$2.50.

It may be supposed that the joint efforts of Dr. Simon Newcomb and Professor Edward S. Holden to write a work on Astronomy has resulted in the production of a work which may be accepted by the public as a reliable and able exposition of the subject.

The attempt, however, to compose a text book in Astronomy which should be equally applicable to the class of a college, and to the general reader, was a task which presented few elements of success; we are not therefore surprised to find that the authors candidly state in their preface that in spite of the title selected for the book that the work was principally designed for the use of those who desire to pursue the study of Astronomy as a branch of liberal education.

Regarded in this light the work is a great success, for the general reader will find by a careful perusal of this manual that he has mastered all the leading points in the study of Astronomy in sufficient detail, to enable him in the future to fully comprehend whatever he may read on this subject. The work in question may well serve as a model for those desirous of writing scientific manuals; in simple, but forcible language, the most complicated explanations are presented in a form that may be comprehended by a reader of ordinary intelligence without mental effort, while the interest of the student is maintained throughout.

The description of astronomical instruments and their uses forms a valuable portion of the work, and all the details of observatory work are explained by the aid of good illustrations; thus all the methods by which astronomical research is carried on at the present day are described by one who was himself at that time a member of the corps having in charge one of the most completely equipped observatories that has yet been organized.

The three branches, into which Astronomy is now divided, are all ably treated by the authors, and it is not difficult to detect the plan adopted by the authors in dividing their work.

We regret this manual was not considered worthy of a good index, for on this account the book is valueless as a work of reference. In future editions it would be well to remedy this unnecessary defect.

CIRCULARS OF INFORMATION OF THE BUREAU OF EDUCATION. NO. 4, 1880. Rural School Architecture, with illustrations.

NO. 5. English Rural Schools. Washington, Government Printing Office, 1880.

The first paper (No. 4) presents a concise yet complete treatise on the proper construction, heating and ventilation of school buildings, prepared by Mr. S. M. Clark, a well-known architect of Boston. The aim of the paper is not so much to lay down rules to be inconsiderately followed, as to give principles and directions suggestive of the plans best to be followed under a variety of circumstances.

This is a thoroughly practical paper, and the whole subject has been well handled by Mr. Clark, and the pamphlet cannot fail to be most useful to School Boards and Committees. The Commissioner of the Bureau of Education deserves the thanks of all heads of families for ordering the production of this timely publication, which, however, merely applies to rural districts, and we trust the manual treating on buildings for high schools, academies and colleges will be published without delay,

as it is a matter of common notoriety that the health of children in many of the large cities, is sacrificed in consequence of the school-rooms being constructed without regard to hygienic principles.

No. 5—Is a description of the condition of rural schools and the progress of elementary education in the rural districts of England, written by Mr. Henry W. Hulbert, late of Middleberry College, based on his personal information. He does not attempt to enforce lessons from his facts, but leaves these to the reflection of the reader.

The facts presented by Mr. Hulbert are most interesting, and would appear to indicate that the effort to educate the masses of the people is making slow but steady progress against the opposition raised against it by certain classes.

We have the authority of Mr. Heller, of the *National Union*, that there was a great cry at first, but advanced education would increase the crime of the land. Of course the contrary has been the real result, and it is stated that there is manifestly less coarseness of manners among the lower classes.

It is admitted, however, that a certain restlessness has been created by advanced education, and "that it has driven children into towns to seek what they consider higher situations, and in some cases it has led to emigration."

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

DR. FLEMING'S CLASSIFICATION OF SCIENCE.

To the Editor of SCIENCE:

There are numberless ways in which knowledge may be classified, as the numerous systems of classification put forward show, and it appears to be a very common notion that all knowledge may be put in a serial order showing the elements in logical dependence. However this may be in metaphysical matters, it is certainly not possible to do so in physical philosophy, for the various manifestations of energy are mutually co-related, and starting with any one of them it is possible to develop almost any of the other forms. In the scheme of Dr. Fleming this does not appear, but in the plan of it he places the doctrine of the correlation of forces high up in Physico Dynamic Science instead of making it almost the first division of Physics. The latter as now understood is the science of energy, and energy always involves two factors, one a mass and the other a velocity. When motions are considered in their geometrical relations, apart from mass, the science is known as Kinematics and as a branch of pure mathematics, it has nothing more to do with physics proper than has geometry, though all problems in physics are more or less mathematical problems, but they become *Dynamic* when mass is involved. Inasmuch as masses of all dimensions, from an atom to the sun, follow the same laws, it surely is not a scientific proceeding to make a grand division here of Astronomy as distinct from the more general division of Mechanics. Astronomy so far as pertains to the genesis of the Stellar Universe is only a development or application of mechanics to large masses of matter. Again the author is mistaken when he says, "Then Natural Philosophy monopolizes the whole field. Now Chemical Philosophy has taken the rank of a distinct department." The fact is that since the discovery that chemism is dependent upon mass, the science has been swallowed up entirely in physics, and every so-called chemical problem is a pure physical problem. Chemism is one of the correlated forms of energy and the logical importance is the same as that of heat and electricity.

B. D.